



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,355	12/18/2001	Kevin George Harding	RD-29313	3948
6147	7590	01/11/2005	EXAMINER	
GENERAL ELECTRIC COMPANY GLOBAL RESEARCH PATENT DOCKET RM. BLDG. K1-4A59 NISKAYUNA, NY 12309			PERUNGAVOOR, SATHYANARAYA V	
			ART UNIT	PAPER NUMBER
			2625	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/683,355

Applicant(s)

HARDING, KEVIN GEORGE

Examiner

Sath Perungavoor

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-7,9 and 10 is/are rejected.
- 7) ☒ Claim(s) 2, 3 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/18/2002</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. (US 3,893,129) in view of Peterson (US 5,325,177).

Regarding claim 1, Endo et al. disclose a method for reducing laser speckle noise observed in an image by a detector (Fig. 5):

projecting laser light having known speckle contrast onto a surface of an object (Fig. 1);

selecting a detector lens having a lens f-number such that the size of the speckle points is controllable (Col. 3 Lines 29-37).

However, Endo et al. do not disclose establishing a maximum observable speckle size.

Peterson discloses establishing a maximum observable speckle size (Col. 2 Lines 29-33).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teaching of Endo et al. with Peterson to adjust the f-number so

Art Unit: 2625

that speckle size is smaller than said maximum observable speckle size. Since, the size of the detector is known one can easily solve for the f-number, where the diameter must be less than the size of the detector.

2. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. in view of Peterson as applied to claim 1 above, and further in view of Ireland (US 5,048,044).

Endo et al. and Peterson meet the claim limitations as per discussion for claim 1.

However, neither Endo et al. nor Peterson disclose laser light projected from a slab diode laser.

Ireland does disclose laser light projected from a slab diode laser (Fig. 5 and 7).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Endo et al. and Peterson with Ireland to further meet the claim limitations. Since, slab lasers provide high power with a small laser medium.

3. Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. (US 3,893,129) in view of Pryor et al. (US 5,811,827).

Regarding claim 5, Endo et al. disclose a method for reducing speckle noise present in an image of a laser line projected onto a surface of an object and observed through a lens by a detector, comprising (Fig. 5):

observing laser light scatter from the surface of the object (Fig. 1);  
determining a lens f-number value corresponding to speckle size (Col. 3 Lines 29-37); and  
altering said detector, lens by adjusting said lens f-number to said determined value (Col. 3 Lines 29-37).

However, Endo et al. does not disclose utilizing observed laser light scatter to identify a minimum speckle noise size obtainable through lens f-number reduction.

Pryor et al. does disclose utilizing observed laser light scatter to identify a minimum speckle noise size obtainable through lens f-number reduction (Col. 3 Lines 37-46).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teaching of Endo et al. with Pryor et al. to further meet the claim limitations. Since, one would use the laser scatter to determine the minimum scatter possible.

Regarding claim 9, all limitations are set forth and rejected as per discussion for claim 5.

4. Claims 6, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Endo et al. in view of Pryor et al. as applied to claim 5 above, and further in view of Sprague (US 3,804,521).

Regarding claim 6, Endo et al. and Pryor et al. meet the claim limitations as per discussion for claim 5.

However, neither Endo et al. nor Pryor et al. disclose the observing the surface finish and in accord altering the coherence.

Sprague discloses the observing the surface finish and in accord altering the coherence (Col. 4 Lines 1-20).

It would have been obvious to one with ordinary skill in the art at the time of invention to modify the teachings of Endo et al. and Pryor et al. with Sprague to further meet the claim limitations. Since, the surface finish is a main contributor to laser scattering, one would alter coherence accordingly. It is commonly known that laser coherence contributes speckle artifacts. Modifying coherence length can effectively reduce the speckle and scatter effects.

Regarding claim 7, Sprague discloses the method of Claim 6 for reducing speckle noise present in an image of a laser line wherein said laser coherence is reduced (Col. 4 Lines 1-20; Disclosed range would encompass both increase and decrease in coherence.).

Regarding claim 10, all limitations are set forth and rejected as per discussion for claim 6.

***Allowable Subject Matter***

5. Claims 2, 3 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Contact Information***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sath Perungavoor whose telephone number is (703) 306-4116. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta whose telephone number is (703) 308-5246, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 09/683,355


Page 7

Art Unit: 2625

Sath Perungavoor

Art Unit 2625

January 6, 2005

  
BHAVESH M. MEHTA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600